The focus of this summer institute is to integrate empirical and theoretical knowledge across disciplines with the aim to understand in different contexts - from extensive data analyses and modeling approaches to clinical practice - how diverse physiological systems and subsystems dynamically interact to produce health and disease. This will be an interactive event with lectures ranging from physics, applied mathematics and biomedical engineering to neuroscience, physiology and clinical medicine, covering a range of physiologic systems from the cellular to the organ level, and will discuss the challenges, current frontiers and future developments in the emerging field of Network Physiology. The institute will address a diverse audience of graduate students, postdocs, research scientists and faculty across a broad range of disciplines and fields, and will provide opportunities for the researchers to exchange new ideas and viewpoints, forge new collaborations and train the next generation of young scientists.